FABRICATION AND CHARACTERIZATION OF ZnO-SnO_2 MIXED NANOSTRUCTURES

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Abstract: In recent years, ZnO, SnO_2 nanostructures have received special attention of researchers due to their potential in commercial applications. ZnO and SnO_2 mixed materials are promising materials for several applications such as gas sensing and optoelectronic devices[1]. Many methods have been introduced for the fabrication of mixed metal oxide nanostructures[2-3]. Most of them involve multiple processing steps which results a core-shell or hierarchical nanostructures. In this work, ZnO-SnO_2 mixed nanostructures were synthesized by a single-step carbothermal reduction method by vapor liquid solid mechanism. The Morphology and crystal structure of fabricated mixed nanostructures were characterized by field emission scanning electron microscope (FESEM), transmission electron microscope (TEM) and X-ray diffraction (XRD). XRD results indicated that the ZnO-SnO_2 mixed nanostructures possessed crystalline structure. FESEM images revealed the uniform nanowires with diameter ranges from 15 nm to 80 nm and length of several tens of micrometers. The distribution of elemental Zn and Sn were found in mixed form in the nanowire which was confirmed by elemental mapping of TEM images. These ZnO-SnO_2 nanostructures can be employed in chemical sensing, photovoltaic and photocatalysis applications.